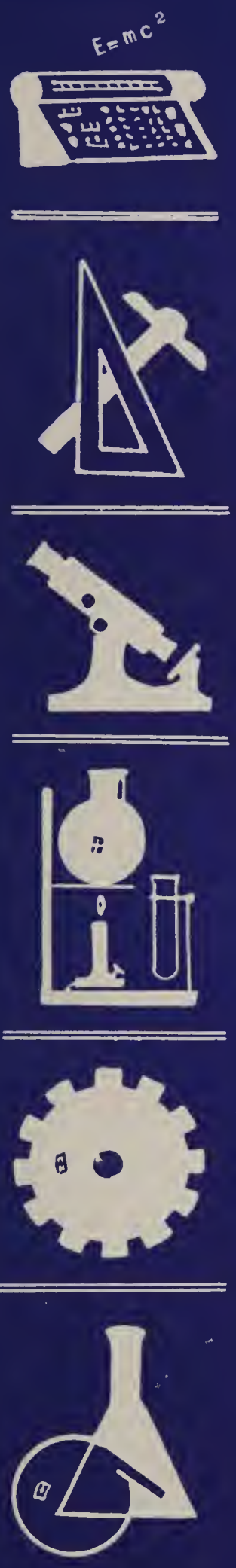

THE CURRENT EMPLOYMENT MARKET

for

ENGINEERS, SCIENTISTS, AND TECHNICIANS

May 1965

U.S. DEPARTMENT OF LABOR
W. Willard Wirtz, Secretary
MANPOWER ADMINISTRATION
BUREAU OF EMPLOYMENT SECURITY
Washington, D.C. 20210

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*Formerly titled, Current Labor Market Conditions in Engineering, Scientific, and Technical Occupations.

This survey is issued semiannually. It is based on field reports on current conditions in 30 major labor areas prepared by State employment security agencies affiliated with the Bureau of Employment Security, statistics on job openings for selected engineering, scientific, and technical occupations placed in interarea recruitment by public employment offices throughout the country, and information obtained from various government agencies, professional societies, and other sources. This study was prepared by the Branch of Skill and Industry Surveys, Division of Research and Publications, Office of Manpower Analysis and Utilization of the United States Employment Service.

BUREAU OF EMPLOYMENT SECURITY - Robert C. Goodwin, Administrator
U.S. EMPLOYMENT SERVICE - Louis Levine, Director

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CURRENT TRENDS IN DEMAND-SUPPLY SITUATION FOR ENGINEERS, SCIENTISTS, AND TECHNICIANS

July 1964 - January 1965

SUMMARY

Job prospects for engineers, scientists, and technicians continued to show added strength early in 1965 following an initial improvement in the job market for these workers during the last quarter of 1964, according to the most recent survey of job opportunities in these occupations completed by the United States Employment Service. Vigor in durables manufacturing and construction, and a spurt in Federal Government contracting which developed late in 1964, brought about increased demand for technical manpower. Meanwhile, many of the engineers, scientists, and technicians who had been actively seeking jobs following significant layoffs by Government-financed space and defense-related programs earlier in 1964 and late in 1963 found employment. Consequently, engineering, scientific, and technician jobseekers entered a tighter job market in early 1965 than they had for about a year.

Evidence of a rallying in the demand for, and a drop in the supply of, manpower in the technical job market emerges from operating data of the Federal-State employment service network. Between the fall of 1964 and early 1965, the number of hard-to-fill jobs for which difficulties in recruiting locally qualified workers prompted interarea recruitment by State employment services jumped over 30 percent. However, active applications by technical jobseekers in local employment offices in 30 major reporting areas dropped over 13 percent during the fall.

The current situation suggests that another of the short-run shifts in supply-demand relationships for technical manpower may be developing. The tightening of the job market for technical manpower during the past few months has reversed the trend toward a looser market apparent since the aerospace and missiles buildup reached a peak in mid-1962. Curtailments in defense and aerospace requirements since then were the primary source of the easing trend which developed during the next 2 years. The impact of contract cancellations, project phaseouts, and completions was particularly notable along the East and West Coasts in metropolitan areas housing the largest concentrations of defense and aerospace contractors.

During the latter half of 1964, however, local job market conditions in these centers have improved. Mass layoffs by defense-related contractors have tapered off. Added demand, particularly in aircraft, nonelectrical machinery, instruments, and among architectural service organizations, laboratories, and job shops, reflected the general temper of the economy. Numerous job-seeking engineers, scientists, and technicians in some areas reappraised local conditions and developed greater willingness to relocate. Reports from some East Coast centers, however, noted that some jobseekers had resisted relocation and had accepted lower-paying assignments, often in different occupations, in expectation of a near-future spurt in demand for technical workers experienced in research and development functions.

As a result of the improvement in the job market, the ratio of applicants in selected engineering, scientific, and technical occupations to unfilled jobs registered in local public employment offices in 10 major East and West Coast centers dropped sharply. In mid-1964 there were nearly eight applicants for each unfilled job registered in these offices. Toward the close of the year, this same ratio was a little over 4 to 1. These centers are: Boston, New York, Newark, Paterson-Clifton-Passaic, Philadelphia, Baltimore, Washington (D.C.), Seattle, San Francisco-Oakland, and Los Angeles-Long Beach.

Nevertheless, job market conditions for the research-oriented engineer, scientist, or technician in these areas remained considerably looser than they had been in mid-1962 which was the most recent peak demand period. Demand for technical manpower in the above-mentioned labor areas was largely concentrated in establishments whose operations are geared to the civilian economy, and employers remained hesitant to employ and retrain research and development experts. Employment in many of the establishments affected by the shift in Federal contracting was at lower levels and some defense contractors had not successfully converted to civilian production. Consequently, the reservoir of engineering, scientific, and technical personnel experienced in research and development functions in these areas has not been fully reabsorbed. At the same time, employers are encountering some difficulty in recruiting technical manpower with the requisite experience in durables manufacture and construction.

The focusing of demand upon production-oriented engineers, scientists, and technicians in the major East and West Coast centers during the past few months paralleled the earlier development of firmer job markets for these workers in other parts of the country which accompanied the upswing in the general economy during 1963-64. Production experience in the specific product line remained a primary specification by employers seeking these workers. Steel producers in inland northeast and midwest centers contributed to this demand as did manufacturers of chemicals, fabricated metals, machinery, and refiners of petroleum in various parts of the country. Unmet needs among midwest aircraft manufacturers continued. The job markets for technical manpower in areas such as Pittsburgh, Detroit, Cleveland, Chicago, Milwaukee, and St. Louis were favorably

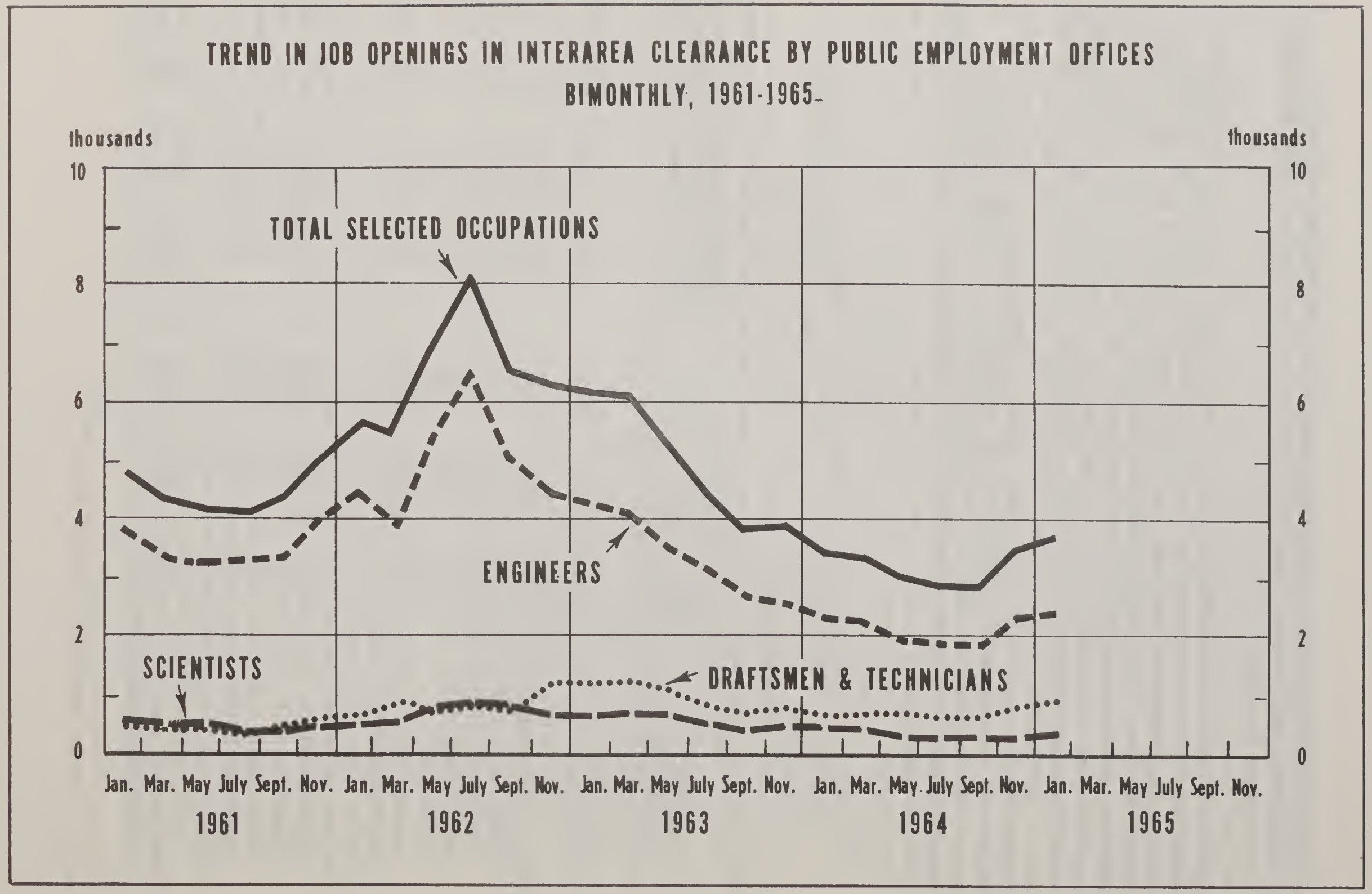
affected by these trends. New requirements in Government contracting, primarily in construction and electronic research, reached into Florida, Arizona, and New Mexico.

The trend toward increasingly specific requirements in employer orders continued despite a tightening in the job market. Employment service offices reported more emphasis on recent formal training as part of job specifications. More employers were limiting openings to those who acquired their degrees or apprenticeship within the past few years. Less interest was exhibited in an engineer or scientist who had acquired his Ph.D. degree over 10 years ago. Apparently, the more youthful applicant is preferred in the current market. The jobseeker who had left formal study a number of years ago, judging from employer specifications, might well be advised to "brush up" by returning to formal training. New refresher training and the introduction of new courses related to production processes was reported at some engineering colleges in response to this demand.

Number of Nonagricultural Job Openings in Selected Occupations in Interarea Recruitment at Public Employment Offices, U.S. Total January 1965, November 1964, and January 1964

Selected occupations	Job openings			Change to January 1965 from:			
				November 1964		January 1964	
	Jan. 1965	Nov. 1964	Jan. 1964	Number	Percent	Number	Percent
All selected occupations	3,695	3,496	3,486	+289	+5.7	+299	+6.0
Engineers, total	2,364	2,276	2,324	+88	+3.9	+40	+1.7
Chemical	145	135	134	+10	+7.4	+11	+8.2
Civil	353	353	214	0	0	+139	+65.0
Electrical	573	583	629	-10	-1.7	-56	-8.9
Industrial	211	218	296	-7	-3.2	-85	-28.7
Mechanical	635	628	661	+7	+1.1	-26	-3.9
Aeronautical	392	312	338	+80	+25.6	+54	+16.0
Natural science occupations	421	349	469	+72	+20.6	-48	-10.2
Chemists	171	153	154	+18	+11.8	+17	+11.0
Physicists	66	55	140	+11	+20.0	-74	-52.8
Mathematicians	62	46	61	+16	+34.8	+1	+1.6
Other	122	95	114	+27	+28.4	+8	+7.0
Draftsmen	691	667	497	+24	+3.6	+194	+39.0
Laboratory technicians	219	204	196	+105	+7.4	+113	+11.7

Source: State employment security agencies.


TREND IN JOB OPENINGS IN INTERAREA CLEARANCE BY PUBLIC EMPLOYMENT OFFICES
BIMONTHLY, 1961-1965
thousands
thousands
10
8
6
4
2
0
TOTAL SELECTED OCCUPATIONS
ENGINEERS
SCIENTISTS
DRAFTSMEN & TECHNICIANS
Jan. Mar. May July Sept. Nov. Jan. Mar. May July Sept. Nov. Jan. Mar. May July Sept. Nov. Jan. Mar. May July Sept. Nov. Jan. Mar. May July Sept. Nov.
1961
1962
1963
1964
1965

ENGINEERS

The character of the engineers' job market has been shifting during the past few months. The 2-year downtrend in unmet needs, as measured by data from Federal-State employment service operations, has been reversed. The firmer job market for engineers which has been developing reflects added demand arising from a prosperous civilian economy as well as the resumption of some Government contracting. At the same time, the number of engineering jobseekers registered at reporting public employment service offices has been dropping. Mass layoffs arising from the completion, termination, or phaseout of Federally-financed contracts, which repeatedly boosted applicant supply in reporting offices since the spring of 1963, have tapered off. As a result, there were between two and three engineering jobseekers for each unfilled job registered at local public employment offices in 30 major areas toward the close of 1964. These areas had reported a ratio of almost four applicants for each opening 6 months earlier.

More Engineers Sought for Civilian Production

The change in the nature of the unmet demand for engineers is as significant as the shift in the level of unfilled needs. Today's emphasis is upon the engineer capable of performing functions related to the production of goods for the civilian economy. This contrasts sharply with the situation in the early 1960's when local shortages of personnel capable of fulfilling research and development functions essential to the missile and space buildup dominated the engineers' job market.

Recruitment of hard-to-find engineers for the rapidly expanding aerospace, electronic, and related industries reached a peak in mid-1962. At that time, there were fewer than two engineers registered for each unfilled job at reporting employment service offices. Despite a slump in demand following this buildup, hard-to-fill needs for engineers in some later developing space projects continued to focus attention upon local shortages of engineers geared to the challenges of the newest developments in science. At the same time, layoffs in some Federally-financed projects had begun and a recognizably firmer tone in durable goods manufacture and construction appeared as a counter-trend to the looser job market for engineers which had emerged from defense and aerospace related changes. Consequently, during 1963, there were between two and three applicants for every unfilled opening in reporting employment service offices.

During the first half of 1964, however, the tempo of recruitment for durable goods industries slowed. Extensive layoffs of engineering personnel continued in some major defense and aerospace centers. Unmet requirements for engineers, as measured by data from Federal-State employment service operations, were at the lowest level since early 1958. Some employment service offices were reporting unusually high proportions of unemployed engineering jobseekers among their registrants. Constriction

of job opportunities for electrical and aeronautical engineers--two of the engineering specialties for which hard-to-fill needs had been most critical earlier in the decade--was particularly marked.

Recovery from the midsummer low was rapid and widespread during the last quarter of 1964. Unmet needs jumped nearly 30 percent and applicant supply dropped 12 percent in the 30 reporting areas. Local stringencies of engineering talent qualified for unfilled jobs increased. Interarea recruitment of engineers rose 28 percent between September 1964 and January 1965. As the new year began, overall supply-demand relationships in the engineers' job market had returned to the levels prevailing toward the close of 1963.

Improved Job Outlook Affects All Specialties

Renewed vigor in recruitment by durables manufacturers and construction industry employers, as well as added demand arising from Federally-financed activity, helped improve job prospects for all engineering specialties. This pickup had a different impact on the various specialties. Toward the close of 1964 and early 1965, brightest job prospects were for civil engineers. The supply of civil engineering applicants in the 30 reporting labor areas dropped below 500--the lowest level during the 7 years in which these data have been reported. Many types of designers were being recruited. Demands ranged from heavy machinery, such as paper-making machinery, to highway and piping design. Local stringencies for soft-rock tunneling, reinforced concrete, and road planning specialists also developed. Hard-to-fill needs were located in many areas in 35 States.

Increasing activity in the field of electronic computing and unmet needs in aircraft, electrical equipment, and construction establishments, as well as new demands in radar detection equipment and in various programs in the Cape Kennedy space center, helped to strengthen the electrical engineers' job market toward the close of 1964. Despite the continuation of some geographic and skill dislocations, which resulted from mass layoffs and contract shifts in 1963 and early 1964, the ratio of electrical engineering jobseekers to unfilled openings in the 30 reporting offices dropped from nearly 5 to 1 in May to under 3 to 1 in November 1964.

Toward the close of 1964, unmet needs in the aircraft, nonelectrical machinery, and construction industries and in engineering and architectural services and Federal facilities provided the largest number of job opportunities for mechanical engineers. Requirements were largely for specialists capable of handling problems in machine design, layout, and adaptation of machinery to the needs of manufacturers in a wide variety of industries. Much of this demand was located in Midwestern durables manufacturing centers. However, increasing needs were also cited in coastal cities such as Philadelphia and San Francisco for workers in pressure vessel, piping, tool design, and structural and other construction work. As in electrical engineering, numerous mechanical engineering

Number of Engineering Job Applicants Registered at Public Employment Offices in 30 Major Labor Areas
November 1964, May 1964, and November 1963

Engineering specialty	Active applicants: Nov. 1964 Total	Active applicants: Nov. 1964 With college degree	Active applicants: May 1964	Active applicants: Nov. 1963	Percent change to November 1964 from: May 1964	Percent change to November 1964 from: Nov. 1963
Engineers, total	6,622	3,912	7,539	6,413	-12.2	+3.2
Chemical	353	299	324	350	+9.0	+0.8
Civil	593	427	692	767	-14.3	-22.7
Electrical	1,862	1,149	2,075	1,514	-10.3	+23.0
Industrial	1,291	570	1,483	1,331	-12.9	-3.0
Mechanical	2,165	1,227	2,560	2,187	-15.4	-1.0
Aeronautical	229	147	224	100	+2.2	+129.0

Source: State employment security agencies.

Number of Engineering Openings Unfilled at Public Employment Offices in 30 Major Labor Areas at end of
November 1964, May 1964, and November 1963

Engineering specialty	Unfilled openings at end of: Nov. 1964	Unfilled openings at end of: May 1964	Unfilled openings at end of: Nov. 1963	Percent change to November 1964 from: May 1964	Percent change to November 1964 from: Nov. 1963
Engineers, total	2,531	1,962	2,686	+29.0	-5.8
Chemical	145	97	169	+49.5	-14.2
Civil	388	316	311	+22.8	+24.8
Electrical	650	429	723	+51.5	-10.1
Industrial	250	249	245	+0.4	+2.[illegible]
Mechanical	694	683	904	+1.6	-23.2
Aeronautical	356	166	281	+114.4	+26.7

Source: State employment security agencies.

jobseekers with aerospace and related backgrounds continued to encounter difficulties in meeting employer specifications. There was some tendency toward relocation from areas in which applicant supply had increased as a result of recent layoffs. Employers in these areas often seemed to prefer recent college graduates with limited experience to older men with "unrelated experience." At the end of November, there were about three mechanical engineering applicants for each unfilled opening registered in the local employment offices in the 30 reporting areas. Six months ago, this ratio was nearly 4 to 1.

A pickup in contracts for the aircraft industry, and additional Federal Government requirements, tightened the geographically limited aeronautical engineering job market. Skill requirements varied from the long-standing needs for highly qualified specialists in St. Louis to the newer needs for less specialized aeronautical engineers in Seattle. Other significant demand reported through the Federal-State employment service system was limited to Los Angeles-Long Beach and Cape Kennedy (Fla.).

... the engineers' job market in 30 major areas december 1964

NEW ENGLAND REGION:

Boston, Massachusetts: Decline in number of active jobseekers and upswing in classified advertising cited as indications of improving employment prospects for engineers. Extensive layoffs in many industries, particularly electronics, tapered off by the end of 1964. Many electronic engineers relocated. Report from the area states, however, that a sizable number have been "sitting it out" because of local optimism concerning future growth in engineering manpower requirements. Many of these specialists are intermittently employed in area "job shops." Current demand emphasizes specific skills and extensive experience. Most sought after are experts with experience in piping work, heating, ventilating, and air-conditioning. New graduate programs in mechanical engineering and creative design and research in aerospace engineering launched at local universities.

Providence-Pawtucket, Rhode Island: Stable job market for engineers linked to relatively unchanging levels of industrial activity in area. Restrictive hiring specifications persist among various durables manufacturers. More than half of the small supply of jobseekers were employed.

MIDDLE ATLANTIC REGION:

Buffalo, New York: Modest improvement in job market for engineers. Pickup in production over the year, notably in electrical appliances, metals processing in steel mills, and auto stampings led to a decline in applicants. Little need came from aircraft parts producers as employment stabilized at a level below last year. Local offices had two jobseekers for each opening toward the end of 1964--half were degree holders.

New York, New York: Tone of job market for engineers has improved although surplus of applicants offering experience gained in firms which had Government contracts persists. Although applicant supply declined during the latter half of the year, there were still six jobseekers for each unfilled opening at local public employment offices as 1964 drew to a close. Among some defense contractors, a shift from production to design during the summer months resulted in demand for aeronautical engineers. The scarcity of available applicants with design experience continued. Recruitment by out-of-area employers remained a signifcant feature in local job market. Out-migration to surrounding areas reported, but many applicants continued to resist more distant job opportunities.

Newark, New Jersey: Reduced activity in engineers' job market largely associated with drop in Federal recruitment. Both applicant supply and unfilled openings in local public employment offices declined over the year. Nevertheless, there were still between three and four applicants for each unfilled opening held in these offices toward the end of 1964. Available applicants did not have the specific experience and training demanded by employers.

Paterson-Clifton-Passaic, New Jersey: Improved employment prospects for mechanical and industrial engineers accompanied pickup among fabricated metals and machinery and equipment producers. Layoffs from plants engaged in defense contracting, notably military hardware, tapered off. Availability of jobs in other areas contributed to a drop in local applicant supply during the last quarter of 1964. Employers remained selective as number of engineering jobseekers was more than adequate to meet demand.

Philadelphia, Pennsylvania: Skill needs have shifted from electronics to mechanical engineering following retrenchment among major electronics firms engaged in defense contracting. Engineers with backgrounds in machinery, pressure vessel, power piping, structural, and tool design sought by consulting service firms, contracting organizations, and in manufacturing. Demand among large electronics firms engaged in defense contracting at lower levels, but engineering layoffs occurring earlier in the year have tapered off. Overall demand and supply of engineers in area reportedly in balance.

Pittsburgh, Pennsylvania: Sparked by gains among primary metals producers over the year, job market for mechanical and metallurgical engineers brisk. Recent college graduates preferred to applicants offering experience not directly related to employer needs. Trend toward increased enrollment in graduate studies reported.

SOUTH ATLANTIC REGION:

Baltimore, Maryland: Limited recruitment in quiet job market for engineers during past year. Surplus of engineers with defense background remained untapped as local defense contractors completed phase-outs for defense weapons systems development programs. Specific work histories, age, and high salary demands among experienced jobseekers not suited to current area demands. Employers prefer young college graduates.

Washington, D. C.: Favorable job market for engineers continues. Added growth among small private research and development concerns has more than compensated for a drop in demand among larger defense contractors and more selective recruitment for Federal facilities. Other needs included demand for civil engineers in highway and commercial construction as well as for overseas assignments as consultants and teachers.

Atlanta, Georgia: Limited recruitment by aircraft and auto establishments typified sluggish area job prospects during 1964. Nuclear analysis and reactor activity of a local firm transferred to another. Firms in other areas met with little recruitment success locally as available applicants were unwilling to relocate.

EAST NORTH CENTRAL REGION:

Detroit, Michigan: A continued high rate of auto production contributed to needs for mechanical and metallurgical engineers for plant modernization and expansion. Employers held to restrictive hiring specifications, but, nevertheless, found it unnecessary to seek talent from other areas.

Cleveland, Ohio: Growth in the private sector of the economy has more than offset continuing declines in government-financed activities. The supply of jobseekers dwindled over 1964 despite availability of some engineers following contract completions by an aircraft parts firm and phaseout at an ordance facility. Expanded employment was reported in primary metals, notably rolling mills and blast furnances. No change was noted in restrictive hiring specifications, including age, with employers preferring applicants with extensive work histories directly related to the field of work.

Columbus, Ohio: Local employment opportunities were diverse and scattered -- each recruiter in search of a specialist. Available applicants had aerospace skills acquired at local facility in which projects were curtailed over the year. Successful recruitment by firms from other areas in the latter part of 1964 was reported to be a factor in the reduced number of jobseekers.

Cincinnati, Ohio: Limited upturn in local demand for engineers for a wide variety of jobs including research and development, administration, and sales. Employers continued to specify exacting experience requirements, and maintained disinterested attitudes toward engineers formerly employed by major electronics and aerospace contractors in area. Recruitment for jobs in other areas for engineers with electronics and aerospace skills largely responsible for recent drop in applicant supply.

Indianapolis, Indiana: The supply of qualified applicants has been dwindling as area's diverse economy remained active. Some of the needs for civil engineers for highway projects were met by young graduates. Recent requirements for mechanical engineers were in project, estimating, process, tool, and welding duties for a producer of aircraft parts. Much of the unsatisfied demand for electrical engineers has existed for several months--openings were among manufacturers of airborne electronic equipment, radios, television, electrical systems, motors and generators, and utilities.

Chicago, Illinois: Marked improvement in local job market for engineers accompanied growth in durable goods sector during 1964. Shortages and surpluses of specific skills developed as industry requirements shifted. Electrical engineers with quality control and production backgrounds were available in late 1964, but demand for talent experienced in power equipment and installation design was unmet. Similarly, mechancial engineers experienced with heavy machinery and piping design and civil engineers qualified in high rise, bridge, hydroelectric, and highway design were in short supply. Toward the close of 1964, there were between one and two applicants for each unfilled opening registered in local public employment offices--12 months earlier, applicants outnumbered openings 4 to 1.

Milwaukee, Wisconsin: Tight job market for engineers continued--unfilled openings outstripped applicant supply 2 to 1 at the close of 1964. Manufacturing was the major source of demand. Openings for mechanical engineers doubled during the last 12 months. Demand was also strong for electrical engineers, and better than expected for civil engineers in spite of seasonal curtailments in road building and heavy construction. Aerospace employment held firm. Reports from the area state that many firms "have relaxed hiring specifications in the tight market, but some are willing and apparently able to wait until the 'right men' become available." Local offices report two-thirds of the engineering vacancies remained unfilled for at least 4 weeks because of the shortage of qualified applicants.

WEST NORTH CENTRAL REGION:

Minneapolis-St. Paul, Minnesota: Cancellation of unmet needs due to curtailed space program combined with successful recruitment by an expanding producer of computer equipment resulted in sharp drop in unfilled needs, particularly for mechanical and electrical engineers, toward the end of 1964. Stepped-up job-seeking by engineers in the area receded as these opportunities disappeared.

St. Louis, Missouri: Despite recruitment for over a year, large demand for exceptionally well-qualified aeronautical engineers with specific experience in both missiles and conventional flight problems has not been satisfied. Other trends mixed in generally tight job market for engineers. Needs for structural specialists on the upswing as strong demand for mechanical engineers for plant and project engineering, machine design, and sales continued. Recent layoffs and spotty activity in electrical products led to a weaker job market for electrical engineers. Demand for industrial engineers was restricted to those who acquired college degrees within the past 2 years. Restrictive hiring specifications remained in force despite ratio of nearly three openings for each applicant registered at local public employment offices.

Kansas City, Missouri: Limited job market for engineers continued. Recent graduates and experienced engineering jobseekers continued to seek more favorable employment opportunities in other areas.

EAST SOUTH CENTRAL REGION:

Louisville, Kentucky: Small but steady demand for engineers with exceptional skills in various industries not met by available job-seekers. In January 1965, for example, a machinery firm developing a novel waste treatment device was attempting to recruit a civil engineer with working knowledge of biology and bacteriology. There were two applicants registered for each opening; however, better than half were employed and a majority held engineering degrees.

WEST SOUTH CENTRAL REGION:

New Orleans, Louisiana: Although there were more than two openings for each of a limited number of locally available applicants, most of whom were in the younger age brackets and held degrees, restrictive specifications were not relaxed. Chemical and mechanical engineers who completed degree requirements within the past 2 years were sought for research and development in mining and purification of sulphur. Limited demand for various engineers specialized in missile production remained hard to fill.

Dallas, Texas: Only specialized requirements existed in the last quarter of the year as large establishments, in and near the area, had not begun recruitment for staff needs for anticipated defense contracts. Hopes for job prospects produced an added and fluctuating supply of applicants during the past year. Largest changes were among electrical and mechanical engineering applicants attracted to various areas by news of pending Government contracts.

Houston, Texas: Local shortage of engineers qualified for openings among firms servicing the Manned Spacecraft Center has continued. Specific recruitment for highly qualified specialists from other areas as well as hiring of engineering trainees is a current feature of the engineers' job market in this area. Toward the end of 1964, there were less than two applicants registered for each opening at the local public employment offices. This ratio was over 4 to 1 during the corresponding period of 1963.

MOUNTAIN REGION:

Denver, Colorado: Soft market in area with a large supply of engineering jobseekers attributed to continued layoffs in aerospace and supporting activity and to seasonal weakness in construction. While there was virtually no unmet demand for available engineering talent toward the end of 1964, the report from the area indicated that needs for structural, architectural, and mechanical engineers for design work on municipal projects, and geological, metallurgical, and mining engineers should pick up early in 1965.

PACIFIC REGION:

Seattle, Washington: Engineers' job market in this area dominated by major aircraft firm. Situation reversed sharply during 1964. Early

in the year, following cancellation of the Dyna-Soar contract, unmet demands in the area were virtually nil and engineering jobseekers were in surplus. However, late in 1964, large demands for aeronautical and electrical engineers developed. By this time, however, many engineers had relocated. Although needs for electrical engineers were met fairly readily, the local shortage of aeronautical engineers continued into 1965.

Portland, Oregon: Continued growth in construction, hard goods manufacture, business and professional services helped improve job market for engineers during 1964. Toward the close of the year, shortages of civil and electrical engineers became more acute, but the tight market for mechanical engineers eased somewhat.

San Francisco-Oakland, California: Designing and planning for heavy construction dominated area demand for engineers in late 1964 and early 1965. Openings for chemical and mechanical engineers required petroleum refinery experience. Civil engineers experienced with reinforced concrete or soft rock tunneling were wanted for the designing and engineering of a rapid transit system. A pickup in opportunities for electrical engineers was scattered. However, applicant supply in the area, inflated by mass layoffs in aerospace earlier in the year, could not fulfill specifications in these other industries. Little activity reported among electronics and other aerospace employers in the area.

Los Angeles-Long Beach, California: Loose job market for engineers with experience in aerospace continued. Although mass aerospace layoffs occurring during the first 8 months of 1964 have tapered off, openings in this field were limited and demanded highly specialized engineers. Consequently, by year's end, surplused electronic engineers reportedly showed more interest in job prospects in States as distant as Florida and Alabama. Demand for engineers among employers not dependent upon Federal financing increased over the year. These employers encountered shortages of electrical engineers experienced in power, specialized computers, and circuitry design; mechanical engineers able to handle heating, ventilating, and air-conditioning projects or design high speed or rotary equipment; and industrial engineers to act as efficiency planners and develop cost control structures. The aerospace backgrounds of the many available test and instrumentation specialists among electrical engineers, of the quality control experts among industrial engineers, and of the varied specialities among mechanical engineers were ill-suited to these demands. Among civil engineers, applicant supply and employer needs were also poorly matched. Demand was for senior level structural designers--but the supply was largely composed of field engineers unable to handle work on the drawing board. At year's end, local public employment offices had 2,000 active applicants registered--between five and six jobseekers for each opening. More than half among this supply held engineering degrees. At the beginning of 1964, applicant supply and unfilled jobs registered in these offices were nearly in balance and only about a third of the applicants had engineering degrees.

NATURAL SCIENTISTS

Employment service measures of unmet needs for natural scientists indicate that a mild increase in local shortages of highly qualified chemists, physicists, mathematicians, and computing analysts developed toward the close of 1964 and continued through January 1965. Job openings for natural scientists placed in interarea recruitment by State employment security agencies rose 20 percent between November 1964 and January 1965 alone.

These developments occurred in a job market for natural scientists in which curtailed recruitment by Federally-financed research and development agencies had weakened job prospects for physical scientists but had not affected job prospects for chemists during most of 1964. Toward the close of the year, there were between four and five natural scientists seeking jobs for each unfilled opening registered at local public employment service offices in the 30 major reporting areas. This ratio, the same as during mid-1964, remained well above year ago levels.

Toward the end of 1964 and early in 1965, the step-up in hard-to-fill needs for natural scientists originated both in Federally-financed programs and in a wide variety of other industries. Interarea recruitment for persons capable of performing functions related to physics and mathematics was primarily related to basic research and development programs operating with Federal funds while industries as varied as pulp and paper, textiles, copying paper, paints, cosmetics, plastics, and pharmaceuticals were the source of demand for chemists. Hard-to-fill needs for physicists and mathematicians existed in a limited number of areas but unmet demand for chemists was scattered over 32 States. Jobs for mathematicians were largely located in Federal facilities in the Nation's capital and at Cape Kennedy, Fla. The aircraft industry in Seattle, Wash., was the major source of demand for computing analysts. Needs for well-qualified physicists capable of designing optical systems for aerospace projects were located in Los Angeles-Long Beach and in the New York area.

Advanced Degrees and Specialized Experience in Demand

Employer requirements and applicant qualifications in the natural sciences are highly specific. Most employers are not willing to hire scientists trained and/or experienced in functions not related to the specifications of the unfilled job. Greater flexibility in hiring specifications has been evident during periods of rapid increase in demand such as occurred during the large scale recruitment of highly qualified physicists and mathematicians during the aerospace and missile buildup in 1962. However, the long-term trend has been toward an increasing emphasis upon extensive and specific training and experience.

During the latter half of 1964, information developed through Federal-State employment service operations suggested that this trend was a

significant factor in the numerical surplus of applicants to openings registered in reporting employment service offices. Three-fourths of the natural scientists registered in the 30 major reporting areas had college degrees. However, many did not have the advanced degrees and/or specialized experience required by employers. Consequently, unlike engineers and some other technicians, the number of natural scientists registered in the local employment offices in the 30 reporting areas did not decline from May to November 1964.

DRAFTSMEN

By the close of 1964, the firmer job market for draftsmen evident in the Midwest earlier in the year had spread to many parts of the country. Stepped-up requirements in aircraft and machinery-producing establishments, shipbuilding, and architectural services contributed to the general uptrend in demand among durable goods producers which developed during 1963. Sharp declines in the number of job-hunting draftsmen occurred in East and West Coast centers in which applicant supply had risen earlier in 1964 following mass layoffs by defense related establishments. The major exception to this brighter picture was the Los Angeles-Long Beach area which continued to report that the number of draftsmen seeking jobs exceeded the demand.

Operating data from the Federal-State employment service system provide some measure of the improved job market for draftsmen. By the end of November 1964 there were only three applicants for each opening registered in the employment service offices in the 30 reporting areas--almost the same ratio reported during 1962 when demand for the missile and aerospace buildup had reached a peak. However, these overall data mask the significance of the oversupply of draftsmen in Los Angeles-Long Beach. Toward the end of 1964, well over a third of the draftsman applicants in the 30 reporting areas and less than 7 percent of the openings were registered in Los Angeles-Long Beach. In mid-1962, only 13 percent of the applicants but almost 20 percent of the openings for draftsmen were located in this area.

Most Job Markets Tighten

In reporting areas other than Los Angeles-Long Beach, growing shortages of draftsmen and excellent job prospects were consistently cited. In St. Louis, for example, the brisk market for draftsmen during 1963 was largely in aircraft functions and at a Federal map-making facility. During 1964 these needs shifted toward demand for draftsmen specialized in architectural, piping, structural, and mechanical functions. In Midwestern centers such as Indianapolis, Cincinnati, Chicago, and Milwaukee, openings were largely in mechanical, structural, and electrical fields. Hard-to-fill jobs included such specific requirements as draftsmen experienced in layout, design, and detail for piping and equipment for chemical processing facilities. Improved on-the-job training opportunities for those with some background in mathematics were noted, and the immediate placement of trainees completing courses for mechanical draftsmen conducted under the Manpower Development and Training Act was reported.

Many of the areas in which the local job market for draftsmen previously had been most seriously affected by cutbacks among firms operating largely under Government contracts witnessed a drop in applicant supply and a firming of local area demand during the latter half of 1964. The resulting improvement in local job market conditions for draftsmen in these areas was related both to successful placements of draftsmen

in durable goods manufacturing and construction industries and the out-migration of specialists with extensive backgrounds in electronics and other defense-related activites. The contrast with conditions 6 months and a year ago was particularly marked in Philadelphia and in Seattle. In Philadelphia, applicants had outnumbered openings by over 30 to 1 in May 1964. By November 1964, available applicant supply was reportedly limited to older workers and marginally qualified applicants. Demand was spread among many types of employers seeking mechanical draftsmen and among engineering job shops and shipbuilding firms. There was also a local shortage of marine draftsmen. In Seattle, the operations of a major aircraft establishment dominated the local job market for draftsmen. Toward the close of 1964, new requirements with this firm encountered local shortages of draftsmen as the large numbers laid off toward the close of 1963 and early in 1964 had relocated.

Despite widespread improvements, reports from a few areas continued to cite placement difficulties for specialized draftsmen laid off by electronics and other defense-related contractors. In New York, San Francisco, and Denver, electronic and other draftsmen jobseekers with research support backgrounds continued to exceed demand. The major sources of local demand for draftsmen were for jobs in the design of industrial, commercial, institutional, and civic projects. Employers were described as hesitant to hire draftsmen with experience limited to defense production.

Some of the geographic dislocation of applicant supply and employer needs in defense-related industries, cited in mid-1964, continued although the level of unmet needs from these industries declined as laid-off workers moved to areas of demand. On the other hand, growing needs among durables and construction industry employers contributed to a rise in the number of hard-to-fill openings in various parts of the country. By January 1965, interarea recruitment for draftsmen totalled nearly 700 openings, almost 40 percent higher than during the same period in 1964. The largest numbers of openings were in aircraft in Seattle (Wash.) and St. Louis (Mo.), at the aerospace and missile center in Huntsville (Ala.), and for draftsmen with extensive experience in various industries in Chicago (Ill.). But the bulk of the hard-to-fill openings was widely scattered over 43 States. However, the types of drafting skill for which qualified workers were not available in local areas were more concentrated. About a third of the hard-to-fill needs were for mechanical draftsmen. Aeronautical and electrical specialists and tool designers were also sought in significant numbers.

Rigid Hiring Specifications Prevail

Despite the growing tightness of the job market for draftsmen, employers continued to adhere to rigid hiring specifications. With the exception of a few employers in some Midwestern centers in which a tight job market for draftsmen has continued since mid-1963, the pattern of demand was for recent experience directly related to the functions of the job offered. Numerous openings in which from 2 to 10 years of experience

were a prerequisite were placed in interarea recruitment. Insistence upon experience and/or training in particular drafting specialities was reported in many areas and may be related to a trend toward a more distinct identification of drafting skills emerging from the growing technological complexities in the industries in which draftsmen are employed.

LABORATORY TECHNICIANS AND ASSISTANTS

Employers continue to encounter difficulty in relieving long-time stringencies for highly qualified and licensed medical technicians. Toward the close of 1964, the mismatching of job requirements and applicant qualifications in the job market for these workers again pointed to a tight job market for licensed medical technicians and a relatively loose job market for other laboratory technicians and assistants. Applicants seeking jobs as laboratory technicians and assistants exceeded openings registered in the local employment offices in the 30 major reporting areas by a ratio of 5 to 1. The ratio of applicants to openings in these same reporting offices has ranged from between five and six jobseekers for each unfilled job for the past 3 years.

Reports from the 30 areas characterize local applicant supply as consisting of two major groups. One group offered industrial skills such as chemists' assistant, refinery tester, or industrial X-ray operator. The second group offered medical skills but was largely composed of applicants who could not meet job specifications regarding experience, licensing, or certification by the Registry of Medical Technologists of the American Society of Clinical Pathologists. Job offers for industrial technicians were readily filled but placements of medical technicians were limited by employers' specifications for well-trained workers. The pervasiveness of the skill mismatch between employer requirements and applicant qualifications is also underlined by the types of openings placed in interarea recruitment by State employment services. Fully three-fourths of the locally hard-to-fill laboratory technician jobs were for medical technicians in 34 States. The only sizable orders for industrial technicians were in Massachusetts where X-ray technicians with experience on ultrasonic and eddy currents were sought as test technicians.

Not all labor areas encountered the same level of difficulty in meeting requirements for medical technicians. Area-to-area differences in the severity of the general shortages, and in the types of skills in short supply, were reported. In New York and Boston, for example, recruitment difficulties were most severe for medical technologists, dental hygienists, and dental technicians. In Chicago, however, the hard-to-fill jobs were largely for technicians with experience and appropriate licenses in fields such as bacteriology, serology, and blood banking.

Problems in the local job market for technicians in the health fields in Los Angeles-Long Beach and San Francisco-Oakland were more complicated. Despite a decline in the number of hard-to-fill openings for medical technicians in these West Coast areas, the number of fully qualified applicants fell far short of openings. However, available applicants for jobs as dental and X-ray technicians were hard to place. Job-seeking dental technicians offered limited skills--employers required all-round, multiskill technicians. In the manufacture of dental appliances, applicants generally offered experience with heavy gold work in partial

bridges, but jobs usually were for technicians skilled in chrome and plastic bridges. Among X-ray technicians, most of the applicants were trained in diagnostic work, but many of the job openings required both diagnostic and therapeutic skills.

Attempts to resolve some of the chronic local area shortages of medical technicians through special training programs have been undertaken. By December 1964, programs to instruct some 700 workers in 21 States in needed medical skills had been approved under the Manpower Development and Training Act. Both institutional and on-the-job training has been undertaken for such specialties as surgical and dental technician, medical and dental laboratory assistant, and X-ray technician. Prominent among the areas where programs were under way at year's end were Boston, Chicago, and Los Angeles. In Boston, training was being provided for some 96 unemployed high school graduates as medical laboratory assistants in university classes to run 15 months. A course especially geared to the training of young workers was providing 41 weeks of training for 30 surgical technicians in Los Angeles. In Chicago, 26 medical technician trainees were enrolled in courses requiring 50 weeks of instruction.

appendix

Technical Notes

Information in this report is based chiefly on two kinds of data, both prepared in the United States Employment Service of the Bureau of Employment Security. Since January 1957, the Bureau has been publishing reports on the number of job openings in a group of selected occupations 1/ placed in interarea recruitment by public employment offices. The source of information on openings in interarea recruitment is the Inventory of Job Openings, published every 2 weeks by each State employment security agency. These inventories list all openings currently in interarea recruitment (a process of matching workers in one area with jobs in other areas) by affiliated State agencies.

Supplementary data on the same occupations were requested from the field offices of the 30 largest labor areas (identified on the following page) for the first time in May 1958. These area labor reports provide information on the local demand-supply relationships for engineering, scientific, and technical personnel in the area.

The demand-supply relationship in the selected categories is not always fully indicated by the numerical data. Active applications or registrations show the number of individuals in the selected occupations who apply for work at public employment offices. In a like manner, openings received and unfilled at the end of the month are not complete measures of demand since they cover only job orders placed with public employment offices. Despite these limitations, the data provide a useful indication of the demand-supply trend and its nature.

1/ The occupations covered and the appropriate code number from the Dictionary of Occupational Titles include: Engineers, metallurgical, and metallurgists (0-14), engineers, chemical (0-15), engineers, civil (0-16), engineers, electrical (0-17), engineers, industrial (0-18), engineers, mechanical (0-19), engineers, aeronautical (0-19.03), engineers, mining (0-20), chemists (0-07), natural scientist, n.e.c. (0-35), draftsmen (0-48), and laboratory technicians and assistants (0-50).

List of Thirty Major Labor Areas by Regions

New England:

Boston, Massachusetts
Providence-Pawtucket, Rhode Island

Middle Atlantic:

Buffalo, New York
New York, New York
Newark, New Jersey
Paterson-Clifton-Passaic, New Jersey
Philadelphia, Pennsylvania
Pittsburgh, Pennsylvania

East North Central:

Cincinnati, Ohio
Cleveland, Ohio
Columbus, Ohio
Indianapolis, Indiana
Chicago, Illinois
Detroit, Michigan
Milwaukee, Wisconsin

West North Central:

Minneapolis-St. Paul, Minnesota
Kansas City, Missouri
St. Louis, Missouri

South Atlantic:

Baltimore, Maryland
Washington, D. C.
Atlanta, Georgia

East South Central:

Louisville, Kentucky

West South Central:

New Orleans, Louisiana
Dallas, Texas
Houston, Texas

Mountain:

Denver, Colorado

Pacific:

Seattle, Washington
Portland, Oregon
Los Angeles-Long Beach, California
San Francisco-Oakland, California

tables

Table I. Trend in Job Openings Placed in Interarea Recruitment by Public Employment Offices, January 1956 and 1957 and Bimonthly, January 1958-January 1965

Month and year	All occupations	Professional & managerial	Selected occupations 1/				
			Total	Engineers	Scientific	Draftsmen	Technicians
Jan. 1956	27,887	12,845	6,803	4,792	435	1,361	215
Jan. 1957	35,629	14,498	8,993	6,349	389	1,988	267
Jan. 1958	14,665	7,726	2,582	1,817	245	315	205
March	14,451	8,244	3,496	2,717	398	204	177
May	15,552	9,439	3,505	2,764	330	244	167
July	14,420	7,514	3,540	2,921	233	212	174
Sept.	15,363	8,732	5,303	4,447	431	255	170
Nov.	17,661	9,308	4,789	3,906	475	243	165
Jan. 1959	16,042	10,530	5,426	4,386	489	377	174
March	17,960	10,820	5,473	4,278	576	391	228
May	23,232	12,828	5,635	4,387	602	402	244
July	20,559	10,112	5,315	4,128	486	495	206
Sept.	21,414	10,140	6,320	5,096	500	548	176
Nov.	21,101	11,740	6,585	5,193	600	616	176
Jan. 1960	19,735	11,834	5,817	4,389	648	605	175
March	21,286	12,611	5,167	3,927	587	442	211
May	19,839	11,217	4,710	3,589	550	364	207
July	17,480	9,589	4,401	3,489	483	272	157
Sept.	15,380	8,137	4,453	3,591	492	201	169
Nov.	15,445	8,310	4,605	3,697	471	248	189
Jan. 1961	17,954	12,033	4,799	3,835	516	296	152
March	17,489	11,515	4,253	3,395	454	236	168
May	16,121	9,828	4,097	3,255	432	244	166
July	16,991	9,830	4,078	3,301	393	192	192
Sept.	16,712	8,740	4,262	3,337	433	230	262
Nov.	18,579	9,198	4,975	3,859	503	358	255
Jan. 1962	21,880	13,966	5,719	4,487	584	446	202
March	24,212	14,295	5,473	3,985	602	539	347
May	28,856	17,823	6,909	5,342	821	497	249
July	27,387	15,592	8,069	6,463	805	461	340
Sept.	24,286	13,069	6,594	5,008	807	560	219
Nov.	23,739	13,446	6,363	4,517	633	960	253
Jan. 1963	23,749	14,497	6,115	4,236	638	861	380
March	25,006	16,266	6,005	4,042	694	930	339
May	24,860	14,718	5,278	3,481	643	816	338
July	21,013	11,475	4,481	3,133	471	636	241
Sept.	19,621	9,276	3,839	2,638	424	532	245
Nov.	20,931	10,811	3,872	2,574	476	638	184
Jan. 1964	18,978	11,082	3,486	2,324	469	497	196
March	17,741	9,730	3,385	2,267	434	500	184
May	20,247	10,932	3,060	1,985	356	507	212
July	18,995	9,854	2,904	1,944	298	503	159
Sept.	18,145	7,715	2,815	1,842	316	463	194
Nov.	20,536	8,188	3,496	2,276	349	667	204
Jan. 1965	22,118	10,609	3,695	2,364	421	691	219

1/ Data since September 1959 will differ from those previously published because of the exclusion of technical writers from the selected occupations.

Source: State employment security agencies.

Table IIa. Number of Active Applicants Registered in Selected Engineering Occupations by Public Employment Offices in 30 Major Labor Areas November 1964, May 1964, and November 1963

Labor area	Engineers total			Electrical			Industrial			Mechanical 1/		
	Nov. 1964	May 1964	Nov. 1963	Nov. 1964	May 1964	Nov. 1963	Nov. 1964	May 1964	Nov. 1963	Nov. 1964	May 1964	Nov. 1963
Total	6,622	7,539	6,413	1,862	2,075	1,514	1,291	1,483	1,331	2,394	2,784	2,287
Atlanta	43	51	39	6	10	6	9	4	8	22	27	18
Baltimore	110	135	59	45	56	14	22	26	14	26	46	20
Boston	385	834	446	85	237	115	104	162	111	111	311	135
Buffalo	160	138	248	25	17	20	41	36	75	71	57	100
Chicago	251	365	615	106	109	176	47	75	156	62	130	169
Cincinnati	28	65	69	3	15	15	13	17	21	9	27	29
Cleveland	56	78	95	13	18	14	8	12	19	26	31	43
Columbus (Ohio)	32	49	48	6	8	13	7	8	15	13	26	10
Dallas	138	125	101	39	28	13	32	32	24	45	46	38
Denver	306	155	86	82	30	19	62	20	11	117	78	31
Detroit	133	198	167	25	24	29	35	40	39	47	102	59
Houston	72	100	132	11	14	21	14	12	17	17	28	29
Indianapolis	33	60	59	6	20	13	8	17	11	16	16	25
Kansas City	31	19	10	8	3	2	9	5	1	5	4	3
Los Angeles-Long Beach	1,988	1,588	868	638	477	237	314	274	142	886	647	341
Louisville	63	51	91	8	6	15	15	10	23	24	20	29
Milwaukee	126	128	139	12	23	29	28	36	32	58	45	47
Minneapolis-St. Paul	93	91	88	23	15	17	13	26	14	35	28	37
Newark (N.J.)	268	367	400	85	117	97	48	72	71	85	118	173
New Orleans	25	46	33	5	9	2	3	9	4	7	10	11
New York	872	1,031	926	271	343	279	158	188	135	264	352	358
Paterson-Clifton-Passaic	186	249	218	65	84	47	36	41	67	59	107	83
Philadelphia	228	429	427	51	132	118	70	112	104	89	138	152
Pittsburgh	86	162	179	14	30	31	23	50	45	19	42	50
Portland (Oreg.)	50	44	62	3	7	10	12	9	13	21	11	14
Providence-Pawtucket	45	54	72	8	9	12	11	16	23	19	22	30
St. Louis	102	148	172	31	42	24	20	26	37	31	54	69
San Francisco-Oakland	467	426	335	117	101	69	88	78	60	152	143	117
Seattle	101	214	126	16	47	34	26	55	24	23	79	33
Washington, D.C.	144	139	103	55	44	23	15	15	15	35	39	34

1/ Includes aeronautical.

Source: State employment security agencies.

Table IIb. Number of Active Applicants Registered in Selected Non-Engineering Occupations by Public Employment Offices in 30 Major Labor Areas, November 1964, May 1964, and November 1963

Labor area	Chemists			Other natural scientists			Draftsmen			Laboratory technicians		
	Nov. 1964	May. 1964	Nov. 1963	Nov. 1964	May 1964	Nov. 1963	Nov. 1964	May 1964	Nov. 1963	Nov. 1964	May 1964	Nov. 1963
Total	841	835	815	1,210	1,228	953	4,080	4,656	4,371	2,986	2,811	3,061
Atlanta	6	4	4	5	7	7	19	6	20	19	31	31
Baltimore	11	15	10	13	10	7	90	95	56	59	62	94
Boston	35	67	36	72	89	26	148	470	318	132	396	215
Buffalo	24	19	30	25	44	32	78	65	122	87	104	142
Chicago	59	54	86	61	50	76	166	104	213	171	122	156
Cincinnati	2	12	6	4	11	11	36	63	66	23	41	30
Cleveland	11	6	10	4	6	4	37	54	74	37	51	52
Columbus (Ohio)	3	5	2	6	7	6	11	53	26	14	23	20
Dallas	13	11	10	40	27	32	44	48	46	43	48	41
Denver	11	6	9	22	33	23	150	92	45	186	98	121
Detroit	22	21	30	27	23	15	78	220	68	69	79	68
Houston	20	24	14	34	38	44	32	25	43	71	43	83
Indianapolis	2	9	4	7	6	5	19	9	33	21	16	30
Kansas City	11	8	6	9	6	3	19	25	9	29	15	11
Los Angeles-Long Beach	135	129	84	300	165	94	1,504	1,113	673	497	368	342
Louisville	16	27	18	5	11	17	20	11	26	54	23	35
Milwaukee	33	38	15	24	43	31	29	13	22	17	8	24
Minneapolis-St. Paul	33	11	11	34	51	32	85	90	123	40	52	64
Newark (N.J.)	60	59	63	25	31	9	88	165	214	136	94	88
New Orleans	5	7	5	21	31	13	16	27	29	27	21	35
New York	144	113	151	233	299	217	623	805	803	349	347	352
Paterson-Clifton-Passaic	18	28	32	18	15	17	52	94	123	58	55	67
Philadelphia	15	31	35	15	20	18	157	325	450	142	192	210
Pittsburgh	14	16	20	18	17	22	68	98	135	122	135	254
Portland (Oreg.)	2	20	6	2	11	2	42	39	55	42	31	23
Providence-Pawtucket	7	5	11	2	1	6	24	17	38	20	17	25
St. Louis	16	17	9	10	12	24	87	124	131	45	26	71
San Francisco-Oakland	62	42	58	61	46	45	253	228	268	357	199	263
Seattle	22	8	16	16	19	17	52	112	81	32	43	29
Washington, D. C.	29	23	24	97	99	98	53	66	61	87	71	85

Source: State employment security agencies.

Table IIIa. Number of Unfilled Openings in Selected Engineering Occupations Listed by Public Employment Offices in 30 Major Labor Areas, End of Month, November 1964, May 1964, and November 1963

Labor area	Engineers total			Electrical			Industrial			Mechanical 1/		
	Nov. 1964	May 1964	Nov. 1963	Nov. 1964	May 1964	Nov. 1963	Nov. 1964	May 1964	Nov. 1963	Nov. 1964	May 1964	Nov. 1963
Total	2,531	1,962	2,686	650	429	723	250	249	245	1,050	849	1,185
Atlanta	15	6	32	1	1	0	0	1	0	9	4	30
Baltimore	11	11	12	6	1	2	0	2	1	2	2	2
Boston	23	19	48	7	1	11	0	2	1	7	12	22
Buffalo	80	93	99	28	25	28	9	12	6	30	35	34
Chicago	173	178	158	29	23	39	35	46	27	70	84	63
Cincinnati	33	19	16	28	3	3	0	4	1	4	9	11
Cleveland	14	31	7	3	4	1	1	5	0	2	13	6
Columbus (Ohio)	21	18	15	4	6	8	2	1	2	8	7	2
Dallas	13	66	63	2	11	20	4	9	13	2	30	18
Denver	3	7	8	0	3	2	0	0	0	0	2	1
Detroit	24	15	22	10	0	3	1	5	7	10	8	11
Houston	39	35	31	5	6	5	6	3	2	14	14	14
Indianapolis	42	72	74	9	11	14	5	7	10	14	24	25
Kansas City	9	14	10	3	0	1	4	6	2	1	4	5
Los Angeles-Long Beach	368	254	699	168	106	252	12	21	24	129	81	344
Louisville	37	36	39	2	0	2	9	11	4	15	14	26
Milwaukee	254	210	149	63	47	40	29	23	12	116	96	58
Minneapolis-St. Paul	59	45	121	12	9	35	10	9	9	21	20	68
Newark (N.J.)	74	88	121	9	13	29	14	20	24	28	33	51
New Orleans	54	23	71	4	3	14	2	2	10	25	13	30
New York	142	94	170	37	33	50	6	6	17	61	33	55
Paterson-Clifton-Passaic	44	25	20	6	10	7	14	4	1	21	6	5
Philadelphia	35	29	14	10	3	8	6	0	0	19	24	4
Pittsburgh	54	59	125	4	12	24	6	5	10	26	23	56
Portland (Oreg.)	17	8	17	5	1	5	2	0	1	4	5	7
Providence-Pawtucket	25	26	22	5	4	4	3	5	4	10	11	12
St. Louis	279	252	267	22	29	34	19	16	37	178	171	163
San Francisco-Oakland	129	78	85	34	13	20	8	6	4	44	34	21
Seattle	221	0	17	74	0	0	16	0	0	127	0	5
Washington, D.C.	239	151	154	60	51	62	27	18	16	53	37	36

1/ Includes aeronautical.

Source: State employment security agencies.

Table IIIb. Number of Unfilled Openings in Selected Non-Engineering Occupations Listed by Public Employment Offices in 30 Major Labor Areas, End of Month, November 1964, May 1964, and November 1963

Labor area	Chemists			Other natural scientists			Draftsmen			Laboratory technicians		
	Nov. 1964	May 1964	Nov. 1963	Nov. 1964	May 1964	Nov. 1963	Nov. 1964	May 1964	Nov. 1963	Nov. 1964	May 1964	Nov. 1963
Total	229	268	224	231	183	295	1,320	1,185	1,174	582	556	532
Atlanta	0	0	0	4	0	5	6	25	3	5	12	3
Baltimore	0	1	6	0	1	1	16	4	13	12	6	4
Boston	5	15	8	3	10	2	14	14	28	70	45	8
Buffalo	0	11	16	0	2	1	74	53	38	2	15	15
Chicago	24	42	20	2	3	17	148	194	92	69	48	42
Cincinnati	1	4	3	0	0	0	29	40	6	5	5	2
Cleveland	1	1	3	0	2	7	25	36	11	23	27	25
Columbus (Ohio)	2	2	4	4	1	1	22	9	6	4	4	5
Dallas	0	5	7	3	4	2	16	24	2	1	12	0
Denver	0	2	0	0	4	6	2	8	2	24	52	38
Detroit	4	0	3	2	1	0	16	12	8	9	15	12
Houston	4	4	5	8	4	4	12	22	24	8	9	14
Indianapolis	4	4	3	1	2	8	9	24	3	6	20	9
Kansas City	0	0	4	1	0	1	9	10	8	1	3	3
Los Angeles-Long Beach	19	19	28	48	35	81	86	69	144	39	8	70
Louisville	10	4	6	0	1	1	14	7	7	6	5	5
Milwaukee	11	21	19	12	14	11	47	77	56	10	14	4
Minneapolis-St. Paul	7	14	6	9	10	9	32	41	72	20	26	25
Newark (N.J.)	33	26	5	8	5	7	58	43	39	29	24	17
New Orleans	3	2	3	6	0	2	31	22	24	11	4	12
New York	57	51	43	29	23	19	104	98	139	111	112	95
Paterson-Clifton-Passaic	11	6	4	2	2	2	13	14	9	4	5	8
Philadelphia	4	2	1	0	0	1	32	10	5	28	5	5
Pittsburgh	7	9	9	4	6	20	54	36	4	8	10	9
Portland (Oreg.)	1	1	1	0	0	1	9	12	17	7	5	3
Providence-Pawtucket	2	2	1	0	0	1	14	8	11	9	2	4
St. Louis	7	12	5	10	7	9	153	175	231	10	20	23
San Francisco-Oakland	5	6	3	5	4	3	53	40	52	37	21	34
Seattle	0	0	0	14	0	0	158	2	19	9	1	13
Washington, D.C.	7	2	8	56	42	73	64	56	101	5	21	25

Source: State employment security agencies.

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